REMARKS

I. Introduction

Claim 16 has been amended and new claims 32 and 33 have been added. Therefore claims 16 to 33 are currently pending in the present application. No new matter has been added.

II. Enablement rejection

Claims 16-31 have been rejected under 35 U.S.C. §112, first paragraph, as being non-enabling with respect to a coating comprising at least one rare earth metal, a transition metal, and a Ta-Si-N-alloy.

Independent claim 16, as amended, recites a layer including at least one rare earth metal, a transition metal and at least one of a Cu-Al-Ti alloy, a Cu-Al-Ta alloy, a Cu-Al-Zr alloy, and a Pt-Al-Si alloy and thus no longer refers to a layer including a rare earth metal, a transition metal and a Ta-Si-N alloy.

It is respectfully submitted that the amendment to claim 16 has obviated the rejection of claims 16-31 for lack of enablement.

III. Indefiniteness rejection

Claims 16-31 have been rejected under 35 U.S.C. §112, second paragraph, as indefinite on the grounds that the term "amorphous-nanocrystalline" of claim 16 is unclear. The Examiner notes that the specification refers to "partially crystalline" as being "amorphous and nanocrystalline".

Page 6, lines 5-12 and associated Fig. 2 of the specification provides definition for this term where it states:

> Fig. 2 schematically illustrates the structure of an amorphous and nanocrystalline or partially crystalline metal, in which the elements are in part arranged randomly in an amorphous structure (region 1) and in part are in the form of relatively small regions with a crystalline structure (region 2). Amorphous and nanocrystalline or partially crystalline metals of this type also have a high resistance to abrasive or erosive wear and have a high Vickers hardness.

(emphasis added).

This section explains that an amorphous-nanocrystalline structure contains both an amorphous structure and relatively small regions having a crystalline

structure and that, significantly, the crystalline regions of such a structure do not negate the advantageous properties of high resistance to abrasive or erosive wear and a high Vickers hardness found in purely amorphous structures.

In light of this guidance, it is respectfully submitted that one of ordinary skill in the art would discern the meaning of an amorphous-nanocrystalline structure in terms of both its structure and its physical properties. Withdrawal of the indefiniteness rejection of claims 16-31 is accordingly respectfully requested.

IV. Obviousness rejection

Claims 16-24 and 27-31 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Dubois et al., U.S. Patent No. 5,472,920.

To establish prima facie obviousness, the prior art reference(s) must teach or suggest all of the claim limitations. In re Royka, 490 F.2d 981, 180 U.S.P.Q. 580 (C.C.P.A. 1974). It is respectfully submitted that the Dubois reference does not disclose or suggest all of the limitations of claims 16-24 and 27-31.

Dubois refers to a thermal barrier consisting of a mixture of at least one refractory oxide such as zirconia (ZrO_2) and at least one quasicrystalline aluminum alloy. See Dubois, col. 3, lines 60-65. It is noted that Dubois provides a definition of the term quasicrystalline alloy as "an alloy containing quasicrystalline phases . . . exhibiting symmetries of rotation which are normally incompatible with the symmetry of translation." Dubois, col. 2, lines 30-36. According to this definition and the further description of x-ray diffraction patterns of quasicrystalline alloys in Dubois (see col. 2, line 47 to col. 3, line 18), it is apparent that a quasicrystalline alloy is not equivalent to an amorphous-nanocrystalline alloy discussed above since it has a regular lattice structure, regardless of any incompatibility between symmetries of rotation and translation. Therefore, it is submitted that the quasicrystalline alloy of $Al_aCu_bCo_cX_dY_eT_fI_g$ referred to in Dubois does not constitute an amorphous or an amorphous-nanocrystalline metal in and of itself.

Moreover, even assuming *arguendo* that the combination of the refractory oxide and the quasicrystalline alloy in Dubois constitutes a mixture of a majority of non-crystalline material (the refractory oxide) with smaller contributions of quasicrystalline alloy material (which is not admitted), the combination of the refractory oxide and the quasicrystalline alloy still does not disclose or suggest an amorphous or amorphous-nanocrystalline metal structure, since in that case one

would simply have an oxide material interspersed with a quasicrystalline metal alloy, rather than a structure in which the alloy itself contains both amorphous and nanocrystalline regions.

It is accordingly respectfully submitted that Dubois does not disclose or suggest each of the features of independent claim 16, or claims 17-24 and 27-31 which depend from claim 16, and that the obviousness rejection of these claims should be withdrawn.

V. New Claims

New independent claim 32 recites a component having a wear-resistant layer including at least one of amorphous metals and amorphous-nanocrystalline metals, the layer substantially including one of the following: a) a Ni-W base alloy; b) a Cu-Al alloy also including one of Ti, Ta, and Zr; c) a Pd-Cu-Si alloy; d) a PT-Al-Si alloy; e) a Ta-Si-N alloy; and f) an alloy of Al, one rare earth element and a transition metal. It is submitted that new claim 32 and its dependent claim 33 are enabled, definite and non-obvious for at least the reasons given above with respect to claim 16.

VI. Conclusion

All issues having been addressed, it is respectfully submitted that all of the presently pending claims are allowable. An early and favorable action on the merits is therefore earnestly solicited.

Respectfully submitted,

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